HTA

6-10-91

OPERATOR'S MANUAL

47" ROTARY BROOM
MODEL NO. FS5047

Thank you for purchasing an HTA attachment for your Honda Tractor.

This manual covers the assembly, operation and maintenance of the HTA Model FS5047 Rotary Broom. For your convenience, a parts guide is also included in this publication.

NOTE: The information in this publication is based on the latest product information available at the time of printing. American Honda Motor Co., Inc. reserves the right to make changes at any time without notice and without incurring any obligation.

Pay special attention to the statements preceded by the following symbols:

DANGER **Indicates that serious injury or death WILL result if instructions are not followed.**

WARNING **Indicates a strong possibility that serious injury or death can result if instructions are not followed.**

CAUTION **Indicates a possibility that minor injury can result if instructions are not followed.**

NOTICE **Indicates that equipment or property damage can result if instructions are not followed.**

NOTE : Gives helpful information.

HTA attachments are designed to give safe and dependable service if assembled and operated according to instructions.

If a problem should arise, or you have any questions about your attachment(s), consult an authorized Honda Multi-Purpose Tractor dealer.

Contents **Page**

THE FOLLOWING PRECAUTIONS ARE SUGGESTED TO HELP PREVENT ACCIDENTS. A CAREFUL OPERATOR IS THE BEST OPERATOR. MOST ACCIDENTS CAN BE AVOIDED BY OBSERVING CERTAIN PRECAUTIONS. READ AND TAKE THE FOLLOWING PRECAUTIONS BEFORE OPERATING THIS TRACTOR AND ROTARY BROOM TO HELP PREVENT ACCIDENTS. EQUIPMENT SHOULD BEOPERATED ONLY BY THOSE WHO ARE RESPONSIBLE AND INSTRUCTED TO DO SO.

TRAINING

1. Read the Operator's Manual carefully before using the tractor and rotary broom. Be thoroughly familiar with the controls and proper use of the equipment. Know how to stop the unit and disengage the controls quickly.
2. Never allow children to operate equipment. Never allow adults to operate equipment without proper instruction.
3. Keep the area of operation clear of all persons and animals.
4. Never operate tractor in non-ventilated area.

PREPARATION

1. Make sure that the attachment drive is disengaged before starting the engine.
2. Never attempt to make any adjustments while engine is running.
3. Thoroughly inspect the area where the equipment is to be used and remove all boards, wires and other foreign objects.
4. Never operate the rotary broom without good visibility.
5. Never wear loose, torn or bulky clothing around the tractor and attachments. It may catch on moving parts or controls, leading to the risk of accidents.
6. Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortably loud noises.
7. Always use safety glasses or a face shield to protect your eyes if tractor is not equipped With enclosed cab.
8. Make sure driveline is well secured to the tractor and attachment.
9. The use of HONDA approved counterweight is recommended.

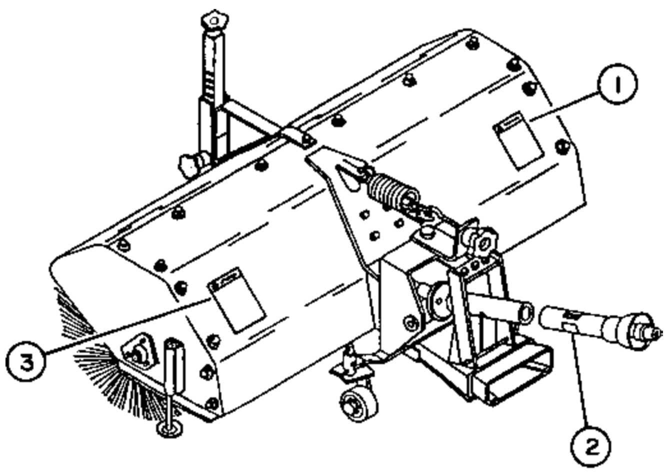
OPERATING

1. Always use caution when operating to avoid possible injury.
2. Do not put hands or feet near rotating parts. Keep clear of discharge opening at all times.
3. Exercise extreme caution when operating on or crossing a gravel drive, walk or road. Stay alert for the hidden hazards of traffic.
4. Keep a careful watch for foreign objects that could damage the rotary broom while operating.
5. Do not sweep across the face of slopes. Exercise extreme caution when changing direction on slopes. Do not attempt to sweep steep slopes.
6. Never operate the tractor or broom without guards, plates and other safety protective devices in place.
7. Use care when backing up.
8. Never direct discharge at bystanders or windows. Never allow anyone in front of the rotary broom.
9. Disengage power to broom when transporting or when not in use.
10. Stop the engine whenever you leave the operating position, before making any repairs, adjustments or inspections.
11. If the broom should start to vibrate abnormally, stop the engine immediately and check for the cause. Vibration is generally a warning of trouble.
12. Take all possible precautions when leaving the vehicle unattended. Disengage the attachment drive, set parking brake, stop the engine and remove the key.
13. Never operate the rotary broom on any kind of carpet.

MAINTENANCE AND STORAGE

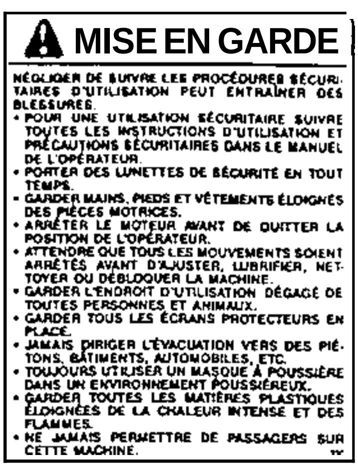
1. Provide adequate blocking before working under the broom when in raised position.
2. When cleaning, repairing or inspecting, make certain that all moving parts have stopped.
3. Keep broom away from flames and intense heat.

REPLACE IMMEDIATELY IF DAMAGED





1. (U.S.A. & CANADA)



3. (CANADA ONLY)



2. (U.S.A. ONLY)



2. (CANADA ONLY)

NOTE: Before mounting this rotary broom on your tractor, your tractor must be equipped with an HTA Model QH5000 Quick Hitch.

NOTICE : Before beginning assembly of this subf rame, please read the instructions through completely and familiarize yourself with all the parts. After completing assembly, torque all bolts according to the torque specification table on page 21.

STEP 1: PREPARATION

a) Insert a parking stand (fig.1, item 1) in each stand support from the underside. Install a 5/32" x 1 1/4" cotter pin in upper hole of each parking stand. Set parking stands in most extended position and secure each stand with a 4mm x 80mm hairpin (fig.1, item 2).

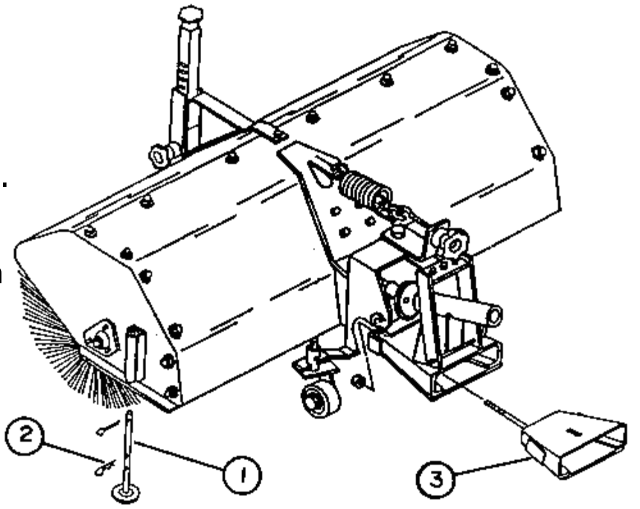


FIGURE 1

b) Install adapter (fig. 1 , item 3 inside broom female hitch. Secure with a 5/8" nylon nut.

C) Attach support plate (fig.2, item 1) on pin of lower left hand lift link. Secure with hairpin.

d) Assemble shackle (fig.2, item 2) with cotter pin to chain and support plate (fig.2, item 1).

e) Attach chain anchor plate (fig.2, item 3) to tractor frame (placing largest hole in line with tractor front mounting hole) using three 5/16" x 1 bolts, lockwashers and nuts.

f) Assemble shackle (fig.2, item 4) with hairpin to chain and anchor plate.

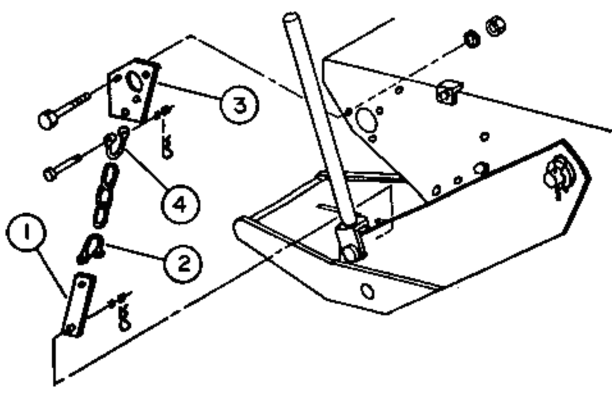


FIGURE 2

STEP 2: ATTACHING BROOM TO TRACTOR

a) Insert driveline half (with quick connect yoke) over broom driveline half. Set driveline on its support.

NOTE: Driveline sliding surfaces must be greased.

b) Insert male quick hitch (fig.3, item 1) into broom female hitch (fig.3, item 2) and place male quick hitch lever (fig.3, item 3) fully forward in "locked" position. Secure male quick hitch latch with the linchpin.

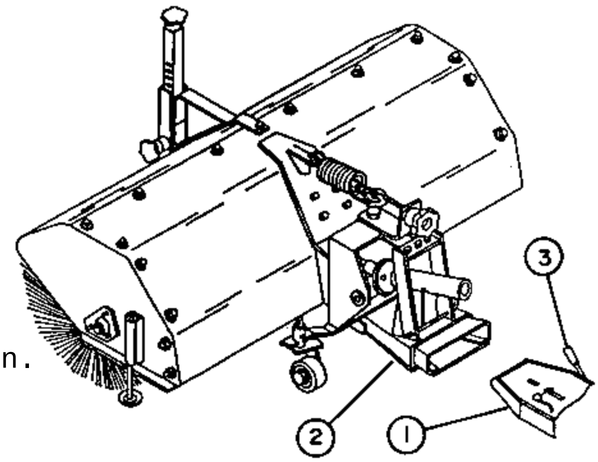


FIGURE 3

c) Connect broom driveline to tractor PTO shaft by sliding back the locking collar on yoke, then push over PTO shaft until the locking collar snaps back fully. Make sure driveline is well secured at both ends.

WARNING: This shaft turns at very high RPM. If the collar is not locked to the PTO shaft at the tractor end, or if the yoke at the broom end is not secured properly, the driveline can fly loose with great force capable of causing serious injury or death.

d) Remove hair pin (fig.4, item 1) from welded sleeve on right hand side of broom mounting bracket. Carefully pull out the pin (fig.4, item 2) to its most extended position and lock in place with same hair pin.

NOTICE: The pin in the inmost position is used to prevent female hitch on broom from being pulled up by the brush ground contact adjustment spring, thus facilitating mounting and dismounting of broom.

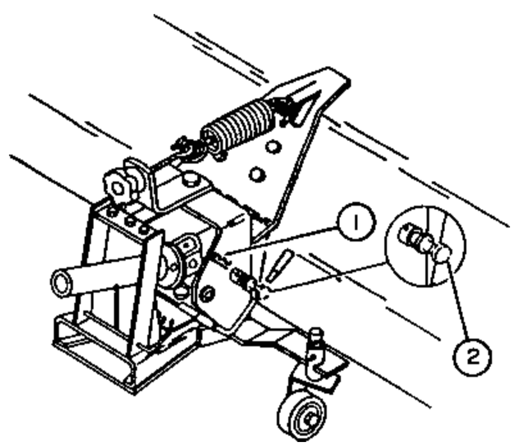


FIGURE 4

e) Correct all adjustment settings on page 9.

STEP 3: OPTIONAL CASTER WHEEL INSTALLATION

NOTICE Caster wheels are required for lawn thatching and to prevent gouging .

a) Remove pin (fig.5, item 1) and hairpin from each caster wheel (fig.5, item 3). Select desired number of spacer sleeves (fig.5, item 2) to remain on bottom portion of caster wheel (see application page 10).

b) Remove parking stands (fig.1, item 1) and replace them with the caster wheels (fig.5, item 3). Place remaining spacer sleeve(s) over caster wheels on upper side of stand supports, and secure caster wheels with pins (fig.5, item 1) and hairpin.

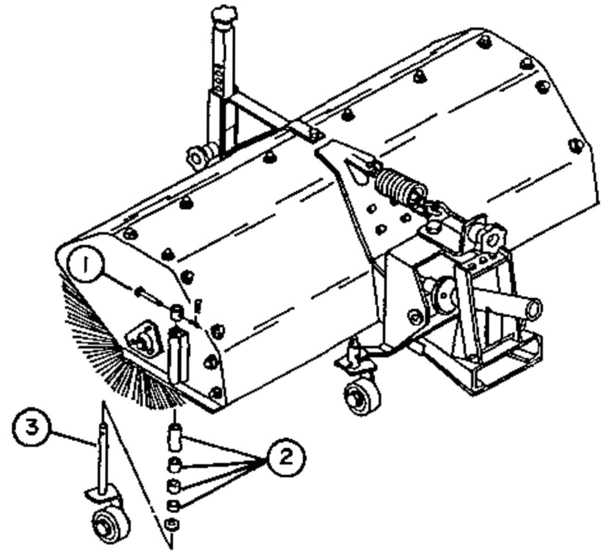


FIGURE 5

OPERATING CONTROLS

1. **RAISING AND LOWERING THE ROTARY BROOM**

   Refer to 'control' section of quick hitch operator's manual (HTA Model QH5000) page 5.

2. **STARTING AND STOPPING THE ROTARY BROW**

   Refer to tractor operator's manual for proper front "PTO" operation.

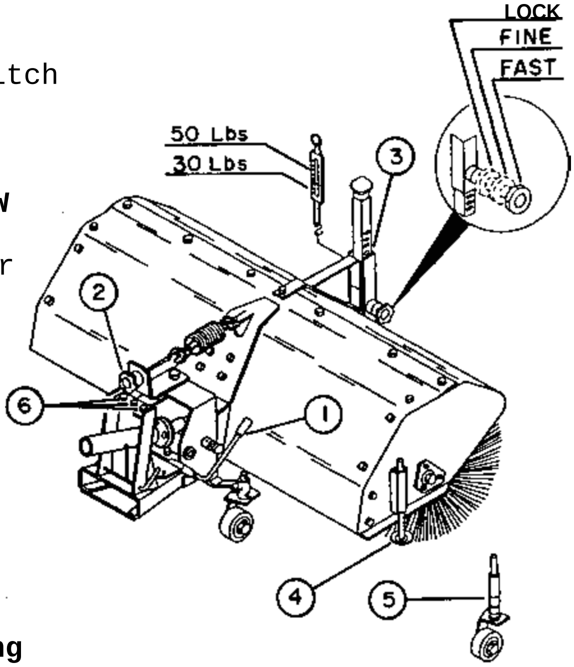


FIGURE 1

ADJUSTMENTS (FIGURE 1)

WARNING Before making any adjustments, stop the broom by moving the clutch lever rearward, stop the engine , set the parking brake and remove ignition key.

1. **BROOM ANGLE ADJUSTMENT (1)**
   With broom raised to transport position, carefully lift angle adjustment lever (1) , select angle 12.5° or 25° either side), release lever and make sure broom is locked at desired angle.

2. **BRUSH TO GROUND CONTACT ADJUSTMENT**
   To increase brush to ground contact, turn knob (2) counter-clockwise. To decrease brush to ground contact, turn knob (2) in a clockwise direction. Use only to compensate brush wear.

   NOTICE Adjust so that broom head when lifted by the front , weighs between 30 - 50 lbs (13.5 kg.- 22.6 kg.). More than this can cause premature brush wear and overheat gearbox.

3. **FRONT WHEEL JACK (3)**
   Pull knob completely outward to reach approximate height adjustment. Pull knob halfway and turn knob 1/4 turn at a time to reach final height.

4. **PARKING STANDS (4)**
   Always use stands when broom is not in use to prevent brush deformation.

5. **OPTIONAL CASTER WHEELS ADJUSTMENT (5)**
   Required for lawn thatching or leaf raking. Height is adjusted to the nearest 1/4" by placing spacer sleeve(s) on upper or lower side of stand support. Adjust casters at 1"-1 1/4" below brush tips (see next page for applications).

6. **SIDE TO SIDE LEVEL ADJUSTMENT**
   With the broom raised to transport position, loosen the three bolts (6), place broom level and tighten the bolts (6) securely.

OPERATING THE ROTARY BROOM

WARNING:

1. **Read the operator's manual carefully. Be thoroughly familiar with the controls and proper use of the equipment.**

2. **Do not allow anyone other than the operator on the tractor. Do not allow any rider on the attachment.**

3. **If tractor is not equipped with optional cab, operator must wear eye protection (face shield etc.) during operation.**

4. **Be sure bystanders are completely clear of tractor, broom and broom discharge area before operating the broom. Contact with tractor, broom or debris discharged by broom can cause serious injury.**

CAUTION: Remove any accumulation of snow, ice, dirt or mud from broom hood and from in between bristles regularly; excess weight will unbalance broom causing premature wear of bristles .

IMPORTANT: For efficient operation, sweep with the tips of the bristles like a broom; not with the sides of the bristles like a mop.

APPLICATIONS:

- **SNOW REMOVAL**

WARNING: Foreign objects in snow may be thrown farther than the snow. Use slowest brush speed that will perform the job. Stay aware of broom discharge direction.

1. This broom works best on snow depth of 6" or less, large amount of snow can be moved if ground speed is reduced.
2. To avoid snow being blown back on the tractor and/or operator, sweep with the wind blowing in the direction of broom discharge.
3. The use of HONDA approved rear counterweight is recommended.

- **LAWN THATCHING AND LEAF RAKING**

CAUTION: Optional caster wheels must be installed to perform these types of operation in order to avoid excessive ground contact.

1. Set caster wheels at 1" to 1 1/4" below brush tips for leaf raking and thatching operation.
2. Slower brush speed and ground speed are more adequate for lawn thatching. This will avoid bouncing which could damage the lawn due to excessive ground contact.
3. Minimize dust by sweeping when moisture is high (not wet) whenever possible.

- **GENERAL SWEEPING (parking lot etc.)**

1. Minimize dust by reducing brush speed and by sweeping on days with high moisture.
2. For light material, angle broom 12.5° right or left rather than fully angled to obtain a wider sweeping path.
3. Prevent damage to broom by removing large foreign objects.

MAINTENANCE SERVICE AND STORAGE

1. Never store the tractor with fuel in the fuel tank inside a building where open flames or sparks are present. Allow the engine to cool before storing in any enclosure.

2. Avoid exposing broom bristles to direct sunlight for long periods. Long exposure to direct sunlight will damage the bristles.

3. Provide adequate blocking before working under the broom.

4. Because of dust raised when sweeping (other than snow), the tractor air cleaner should be checked daily and replaced when necessary.

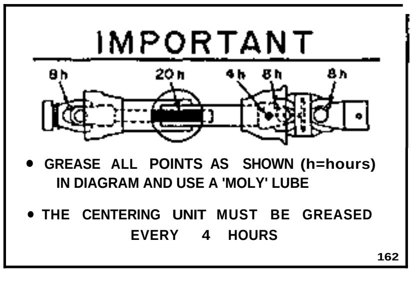
5. Check and tighten all hardware including factory installed hardware, every 8 hours of operation and before operation.

6. Do not alter or modify the broom. If you have any questions, contact your dealer.

LUBRICATION

1. GEARBOX: Check liquid grease level in the worm gear drive every week; run the broom a minimum of 15 minutes to warm up the liquid grease, and make sure gear box is filled to front level plug. If necessary, add (SHELL) DURINA-O or AL VANIA EP-O liquid grease or its equivalent. Do not overfill.

2. DRIVELINE: Grease as indicated on decal below:



3. BROOM: Using a good quality multi-purpose lubricant, lubricate all pivot points and brush ground contact adjustment threads every 8 hours of operation.

4. CASTER WHEELS: Grease swivel bushings every 4 hours of operation.

STORAGE

1. Oil all moving parts.

2. Store broom on storage stands so that the bristles do not touch the ground.

3. If broom bristles are exposed to direct sunlight, protect bristles with a tarp.

4. Store the broom in a dry place.6

BRUSH REPLACEMENT

a) Stop tractor engine, set parking brake and remove ignition key.

b) Remove the 1/2" x 1 3/4" bolt (fig.1, item 1) from each broom side plate (fig.1, item 2) and remove the eight bolts (fig.1, item 3) which secures each side plate to broom housing.

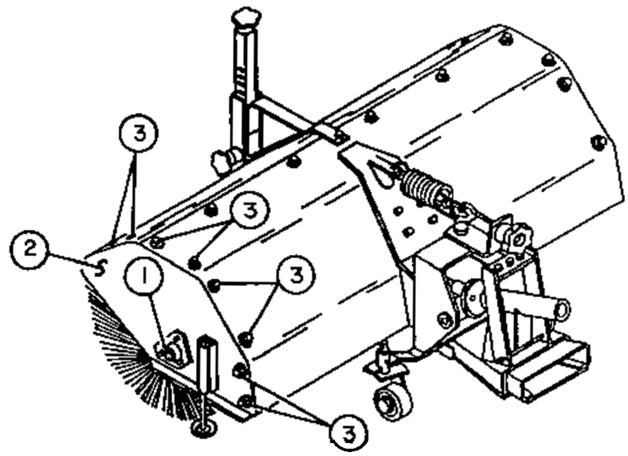


FIGURE 1

c) Remove broom side plates with retainer cups (fig.2, item 1), worn brushes and spacer rings.

d) Place one concave slanted brush (fig.2, item 2) on each side of gearbox facing each other, and install a zigzag brush (fig.2, item 3) next to each slanted brush [placing pins (fig.2, item 4) inside the brush against the concave brush]. Install a spacer ring (fig.2 , item 5) next to the zigzag brush and place another zigzag brush with the pins away from the spacer ring [important: pins inside the zigzag brushes must all be positioned on the same brush support cone (fig.2, item 6)]. Place another spacer ring and a zigzag brush with the pins (fig.2, item 4) on the spacer ring side and so on, spacing brushes with spacer rings. Must end with a zigzag brush with the pins towards the gear box or check figure 2 and redo pattern (fig.2, item 7).

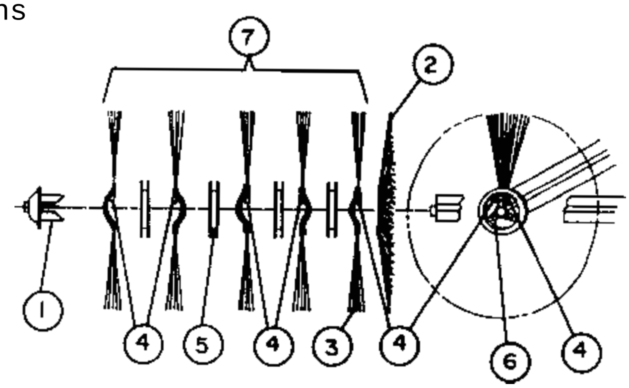


FIGURE 2

IMPORTANT: Pins (fig.2 , item 4) in zigzag brushes must all be on same brush support cone (fig. 2 , item 6).

e) Install the side plates with retaining cup over each shaft end. Secure side plates loosely with the two 1/2" x 1 3/4" bolts (fig.1, item 1), lockwashers and flatwashers.

f) Install the eight 3/8" x 3/4" bolts (fig.1, item 3) and lockwashers securing each side plate. Torque all bolts.

a) Set broom in transport position. Stop tractor engine, set parking brake and remove ignition key.

b) Set broom storage stands in most extended position so that stands extends the broom bristles.

c) Remove hair pin (fig.1, item 1) from welded sleeve on right hand side of broom mounting bracket. Set pin (fig.1, item 2) in the in most position (you may have to slightly raise broom head) and lock in place with hair pin.

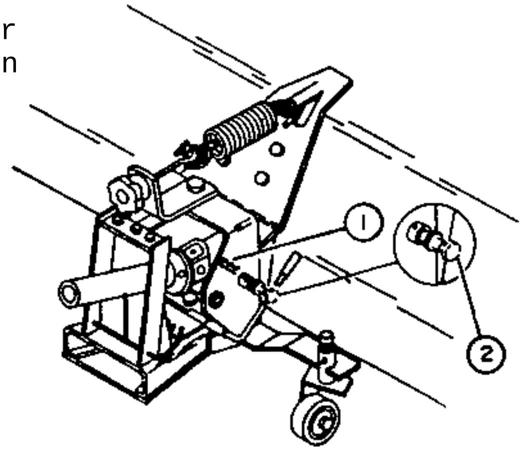


FIGURE 1

IMPORTANT:Once the broom is fully remounted, this pin has to be set in its most extended position in order to allow the broom to follow ground variations.

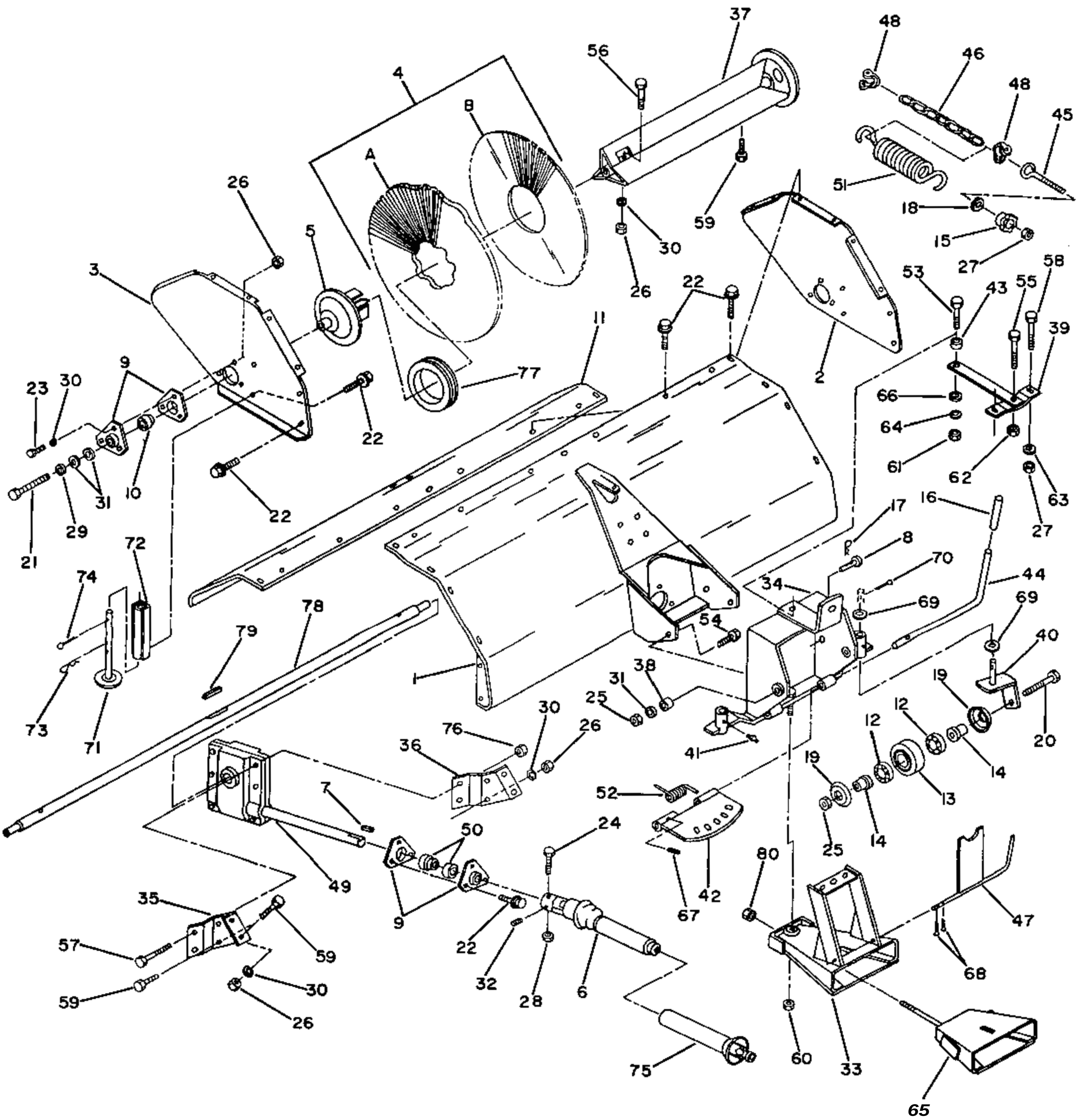
d) Carefully lower broom so it rest on the storage stands.

e) Disconnect broom driveline from tractor PTO shaft and place driveline on its support located on female hitch.

f) Remove linchpin from quick hitch latch. Place male hitch lever. rearward in "unlocked" position.

g) Carefully back tractor away from broom.

FRONT ROTARY BROOM (47" MODEL)



FRONT ROTARY BROOM (47" MODEL)

REF	DESCRIPTION	QTY
1	Housing	1
2	Side plate R.H.	1
3	Side plate L.H.	1
4	Brush package:	1
	Polypropylene set	-
	Steel set	-
	Polypropylene and steel set (50/50)	-
	Includes: 2 concave brushes 10 deg (item B) and 22 zigzag brushes (item A)	
5	Spacer cup	2
6	Driveline female half	1
7	Key 1/4" x 1/4" x 1 1/4"	1
8	Stopper pin	1
9	Bearing flange	6
10	Bearing with out collar	2
11	Hood extension	1
12	Bearing	4
13	Plastic wheel	2
14	Wheel bushing	4
15	Knob (5/16" NC)	1
16	Plastic handle	1
17	Pin (3mm dia x 65mm. hair)	1
18	Nylon washer (11/32" dia hole, flat)	1
19	Wheel cup	4
20	Bolt (1/2" NC x 3 1/2". hex)	2
21	Bolt (1/2" NC x 1 3/4". hex)	2
22	Bolt (5/16" NC x 1/2". flange)	29
23	Bolt (5/16" NC x 3/4". carriage)	6
24	Bolt (1/4" NC x 2 1/2". hex)	1
25	Nut (1/2" NC. nylon lock)	4
26	Nut (5/16" NC. hex)	14
27	Nut (5/16" NC. nylon lock)	3
28	Nut (1/4" NC. nylon lock)	1
29	Washer (1/2.. lock)	2
30	Washer (5/16". lock)	14
31	Washer (9/16" dia hole. flat)	6
32	Set screw (3/8" NC x 1/2". allen)	1
33	Female hitch	1
34	Pivot bracket	1
35	Gear box bracket L.H.	1
36	Gear box bracket L.H.	1
37	Brush support	2
38	Pivot bushing	2
39	Upper coupler	1

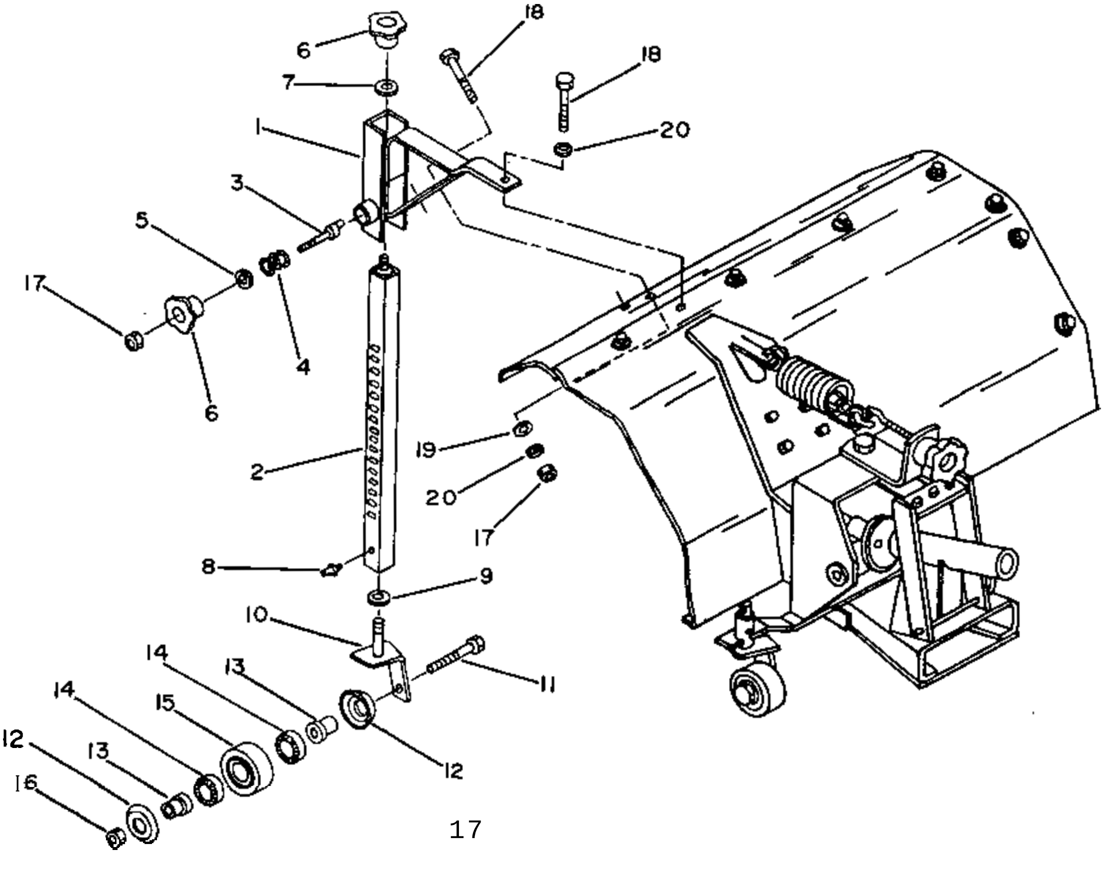
<OVER>

FRONT ROTARY BROOM (continued)

REF	DESCRIPTION	QTY
40	Wheel bracket R.H.	1
	Wheel bracket L.H.	1
41	Grease fitting (1/4" NF)	2
42	Adjustment plate	1
43	Upper bushing	1
44	Adjustment handle	1
45	Eye bolt (5/16" NC x 5")	1
46	Chain 10 1/4"	1
47	Driveline support	1
48	Clevis	2
49	Gear box	1
50	Bearing with collar	1
51	Tension spring	1
52	Torsion spring	1
53	Bolt (7/16" NC x 1 3/4". hex)	1
54	Bolt (1/2" NC x 1 1/2". hex)	2
55	Bolt (7/16" NC x 1 1/4". hex)	1
56	Bolt (5/16" NC x 1 3/4". hex)	2
57	Bolt (5/16" NC x 2", hex)	2
58	Bolt (5/16" NC x 1", hex)	2
59	Bolt (5/16" NC x 3/4", hex)	8
60	Nut (5/8" NC, stover)	1
61	Nut (7/16" NC. hex)	1
62	Nut (7/16" NC. nylon lock)	1
63	Washer (3/8" dia hole, flat)	2
64	Washer (7/16". lock)	1
65	Adapter	1
66	Washer (1/2" dia hole, flat)	1
67	Pin (3/16" dia x 1", roll)	1
68	Pin (1/8" dia x 3/4", cotter)	2
69	Washer nylon (11/16" dia hole, flat)	4
70	Pin (1/4" dia x 1 1/4", cotter)	2
71	Parking stand	2
72	Stand support bracket	2
73	Pin (4mm dia x 80mm, hair)	2
74	Pin (5/32" dia x 1 1/4", cotter)	2
75	Driveline male half	1
76	Nut (5/16" NC, stover)	2
77	Spacer ring	20
78	Output shaft	1
79	Key 1/4" x 1/4" x 1 1/2"	1
80	Nut (1/2" NC, stover)	1

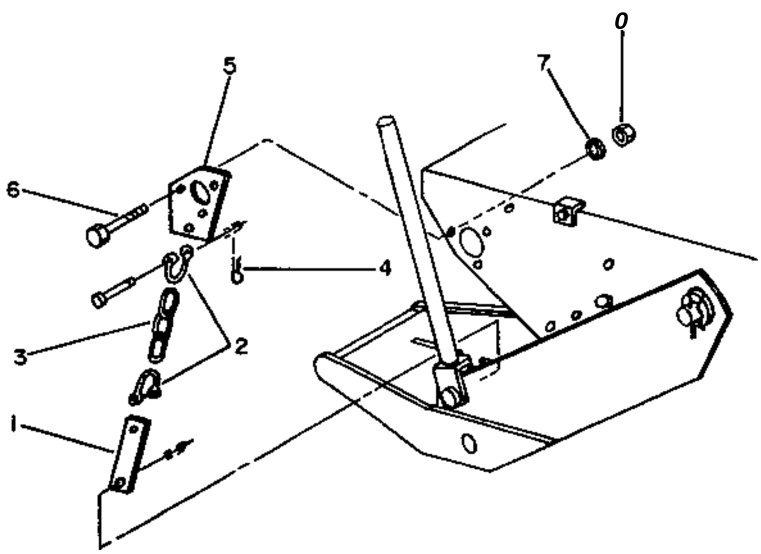
FRONT WHEEL

REF	DESCRIPTION	QTY
1	Jack housing	1
2	Adjustable jack	1
3	Adjustment pin	1
4	Spring	1
5	Washer (7/16" dia hole, flat)	1
6	Knob (5/16" NC)	2
7	Washer (1/2" dia hole, flat)	1
8	Grease fitting (1/4", NF)	1
9	Washer (5/8" dia hole, flat)	1
10	Wheel bracket	1
11	Bolt (1/2" NC x 3 1/2", hex)	1
12	Wheel cup	2
13	Wheel bushing	2
14	Bearing	2
15	Plastic wheel	1
16	Nut (1/2" NC, nylon lock)	1
17	Nut (5/16" NC, hex)	3
18	Bolt (5/16" NC x 1", hex)	3
19	Washer (3/8" dia hole, hex)	2
20	Washer (5/16", lock)	3



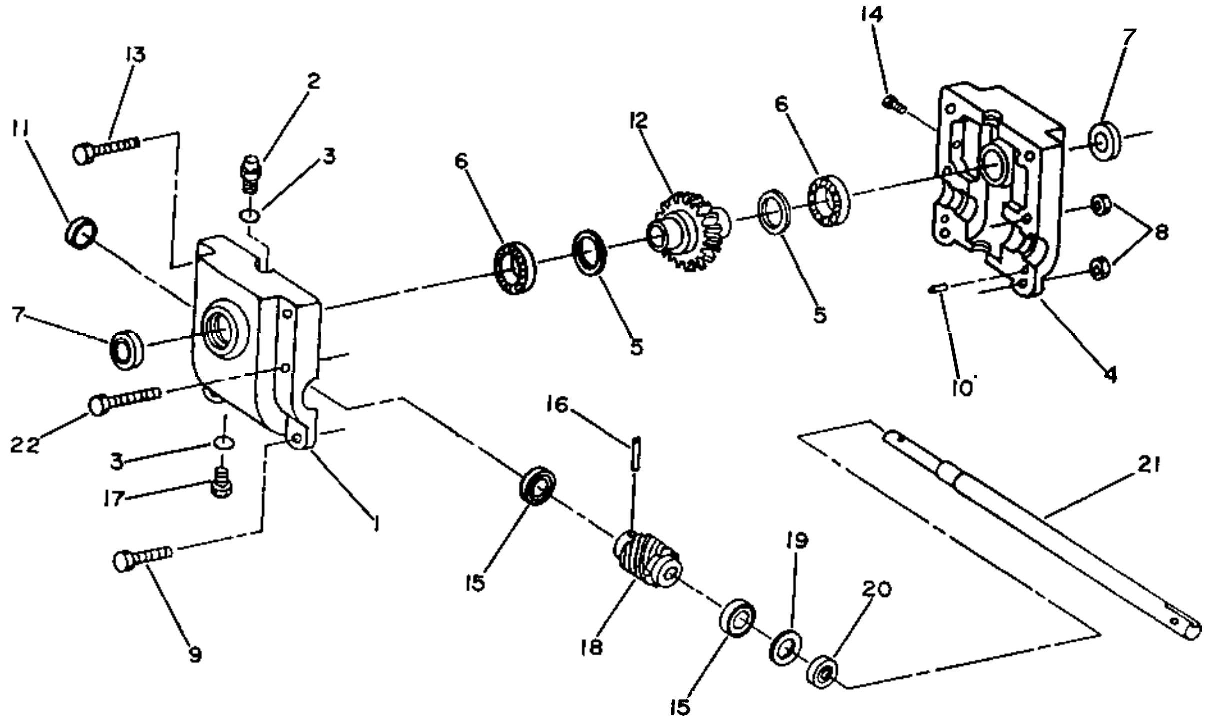
DEPTH CONTROL CHAIN

REF	DESCRIPTION	QTY
1	Support plate	1
2	Clevis	2
3	Chain	1
4	Pin (2.5mm dia x 40mm, hair)	1
5	Anchor plate	1
6	Bolt (5/16" NC x l", hex)	3
7	Washer (5/16", lock)	3
8	Nut (5/16" NC, hex)	3



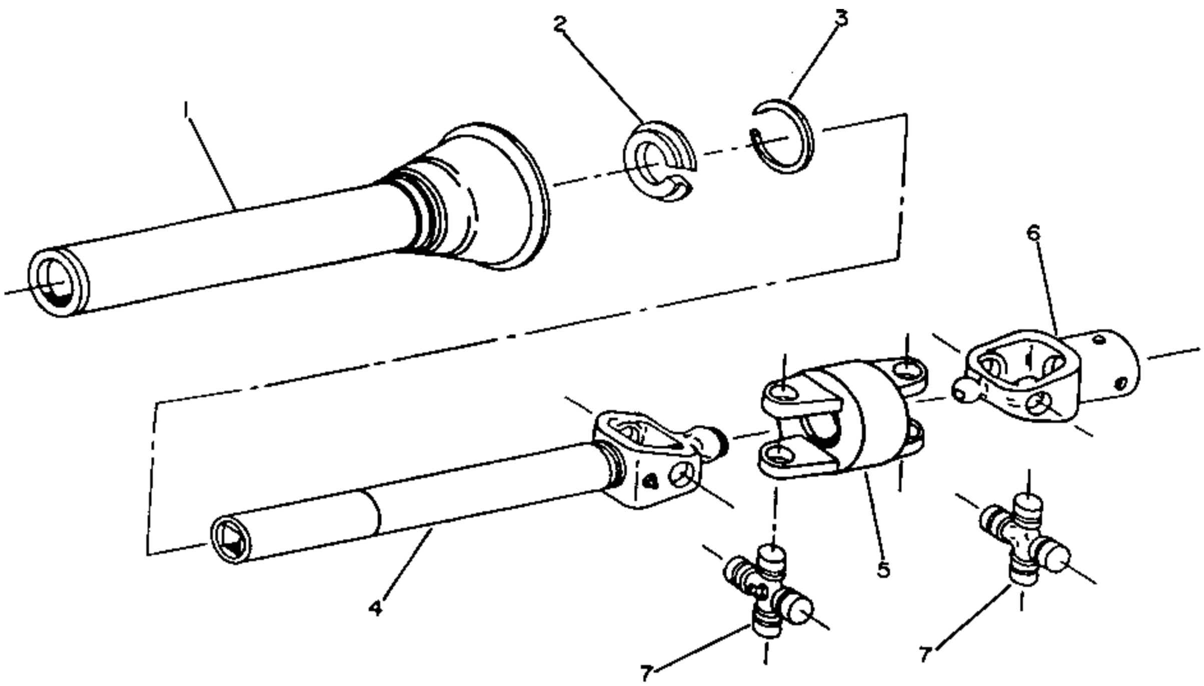
WORM GEAR BOX

REF	DESCRIPTION	QTY
1	Casing	1
2	Plug 3/8"	1
3	O-ring	2
4	Casing ello	1
5	Shim	2
6	Bearing	2
7	Double lip seal	2
8	Hex. nut	6
9	Hex. bolt M8 x 30	2
10	Spring pin	2
11	Cap	1
12	Gear	1
13	Hex. bolt M8 x 65	2
14	Plug 1/4"	1
15	Bearing	2
16	Spring pin	1
17	Plug	1
18	Pinion shaft	1
19	Shim	1
20	Oil seal	1
21	Shaft	1
22	Hex. bolt M8 x 75	2



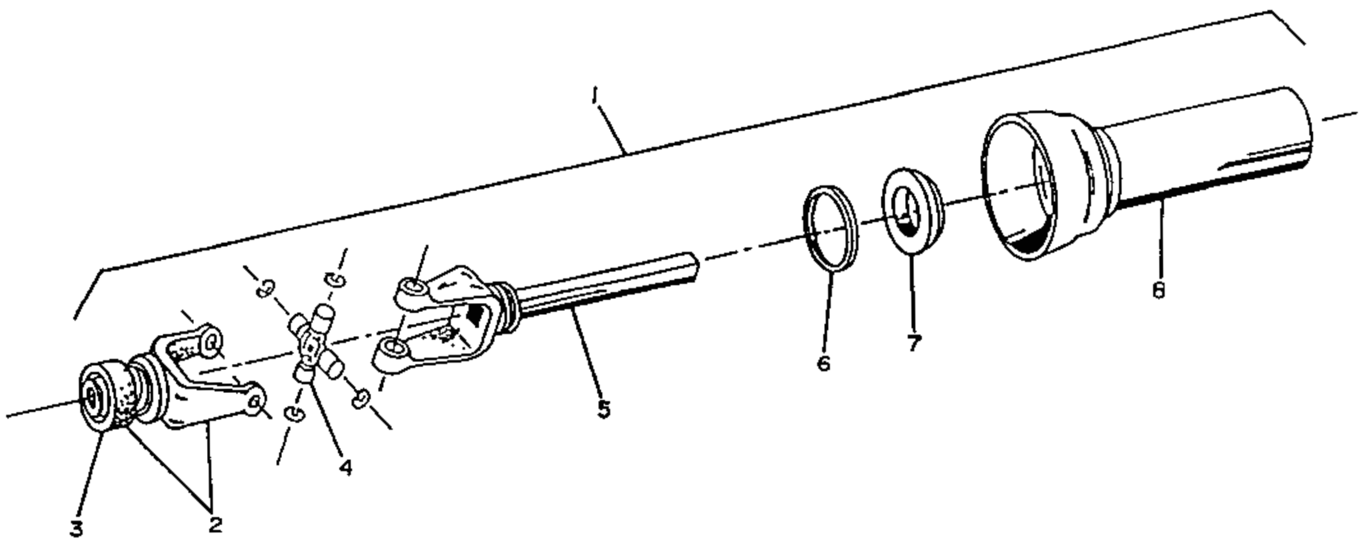
DRIVELINE FEMALE HALF

REF	DESCRIPTION	QTY
1	Inner shield	1
2	Nylon bearing	1
3	Bearing retainer	1
4	Yoke and female shaft	1
5	Double yoke (joint C.V.)	1
6	Yoke 1"	1
7	Universal joint kit	1



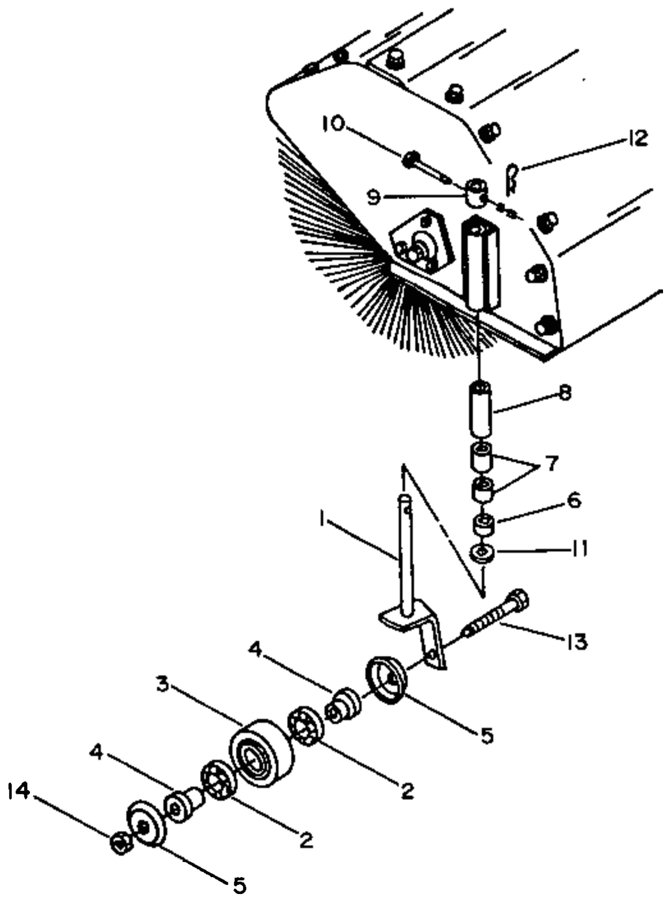
DRIVELINE MALE HALF

REF	DESCRIPTION	QTY
1	Driveline male portion assembly	1
2	Quick connect yoke assembly	1
3	Spring lock yoke repair kit	1
4	Universal joint kit	2
5	Yoke and male shaft assembly	1
6	Bearing retainer	2
7	Nylon bearing	2
8	Outer shield	1



OPTIONAL DOLLY WHEELS

REF	DESCRIPTION	QTY
1	Dolly wheel L.H.	1
	Dolly wheel R.H.	1
2	Bearing	4
3	Plastic wheel	2
4	Wheel bushing	4
5	Wheel cup	4
6	Spacer sleeve 1/4" lg.	2
7	Spacer sleeve 1/2" lg.	2
8	Spacer sleeve 1" lg.	6
9	Spacer sleeve 1 1/4" lg	2
10	Pin 5/16" dia x 1 7/16"	2
11	Washer	2
12	Pin (2.5mm dia x 40mm. hair)	2
13	Bolt (1/2" NC x 3 1/2", hex)	2
14	Nut (1/2" NC. nylon lock)	2



GENERAL TORQUE SPECIFICATION TABLE (Revised 2-74)

USE THE FOLLOWING TORQUES WHEN SPECIAL TORQUES ARE NOT GIVEN

NOTE: These values apply to fasteners as received from supplier, dry, or when lubricated with normal engine oil. They do not apply if special graphited or moly disulphide greaser or other extreme pressure lubricants are used. This applies to both UNF and UNC threads.

SEE Grade No.		2				5				8 *			
BOLT HEAD IDENTIFICATION MARKS AS PER GRADE NOTE: MANUFACTURING MARKS WILL VARY													
		Torque				Torque				Torque			
Bolt Size		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters		Pounds Feet		Newton Meters	
Inches	Millimeters	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/4	6.35	5	6	6.8	8.13	9	11	12.2	14.9	12	15	16.3	30.3
5/16	7.94	10	12	13.6	16.3	17	20.5	23.1	27.8	24	29	32.5	39.3
3/8	9.53	20	23	27.1	31.2	35	42	47.5	57.0	45	54	61.0	73.2
7/16	11.11	30	25	40.7	47.4	54	64	73.2	86.8	70	84	94.9	113.9
1/2	12.70	45	52	61.0	70.5	80	96	108.5	130.2	110	132	149.2	179.0
9/16	14.29	65	75	88.1	101.6	110	132	149.2	179.0	160	192	217.0	260.4
5/8	15.88	95	105	128.7	142.3	150	180	203.4	244.1	220	264	298.3	358.0
3/4	19.05	150	185	203.3	250.7	270	324	366.1	439.3	380	456	515.3	618.3
7/8	22.23	160	200	216.8	271.0	400	480	542.4	650.9	600	720	813.6	976.3
1	25.40	250	300	338.8	406.5	580	696	786.5	943.8	900	1080	1220.4	1464.5
1-1/8	25.58	—		—		800	880	1084.8	1193.3	1280	1440	1735.7	1952.6
1-1/4	31.75	—		—		1120	1240	1518.7	1681.4	1820	2000	2467.9	2712.0
1-3/8	34.93	—		—		1460	1680	1979.8	2278.1	2380	2720	3227.3	3688.3
1-1/2	38.10	—		—		1940	2200	2630.6	2983.2	3160	3560	4285.0	4827.4

* Thick nuts must be used with Grade 8 bolts.

METRIC BOLT TORQUE SPECIFICATIONS

Size of screw	Grade No.	Coarse thread			Fine thread		
		Patch (mm)	Pounds Feet	Newton-Meters	Pitch (mm)	Pounds Feet	Newton-Meters
M6	4T	1.0	3.6-5.8	4.9–7.9	—	–	–
	7T		5.8–9.4	7.9–12.7		–	–
	8T		7.2–10	9.8–13.6		–	–
M8	47	1.25	7.2–14	9.8–19	1.0	12–17	16.3–23
	7T		17–22	23–29.8		19–27	25.7–36.6
	8T		20–26	27.1–35.2		22–31	29.8–42
M10	4T	1.5	20–25	27.1–33.9	1.25	20–29	27.1–39.3
	7T		34–40	46.1-54.2		35–47	47.4-63.7
	8T		38–46	51.5-62.3		40–52	54.2–70.5
M12		1.75	28–34	37.9–46.1	1.25	31–41	42–55.6
			51–59	69.1–79.9		56–68	75.9–92.1
	8T		57–66	77.2–89.4		62–75	84–101.6
M14	4T	2.0	49–56	66.5-75.9	1.5	52–64	70.5-86.7
	7T		81–93	109.8–126		90–106	122–143.6
	8T		96–109	130.1–147.7		107–124	145-168
M16	4T	2.0	67–77	90.8–104.3	1.5	69–83	93.5–112.5
	7T		116–130	157.2-176.2		120–138	162.6–187
	8T		129-145	174.8–196.5		140–158	189.7–214.1
M18	4T	2.0	88–100	119.2–136	1.5	100–117	136–158.5
	7T		150–168	203.3–227.6		177–199	239.8-269.6
	8T		175–194	137.1–262.9		202–231	273.7-313
M20	4T	2.5	108–130	146.3–176.2	1.5	132–150	178.9-203.3
	7T		186–205	252-277.8		206–242	279.1-327.9
	8T		213-249	288.6-337.4		246-289	333.3-391.6

Your satisfaction and goodwill are important to your dealer and to us. All Honda warranty details are explained in the Distributor's Limited Warranty. Normally, any problems concerning the product will be handled by your dealer's service department. If you have a warranty problem that has not been handled to your satisfaction, we suggest you take the following action:

Discuss your problem with a member of dealership management. Often complaints can be quickly resolved at that level. If the problem has already been reviewed with the Service Manager, contact the owner of the dealership or the General Manager.

If your problem still has not been resolved to your satisfaction, contact the Power Equipment Customer Service Department of American Honda Motor Co., Inc:

American Honda Motor Co., Inc.
Power Equipment Customer Service Department
P.0. BOX 100021
Duluth, Georgia 301 36-9421
Telephone: (404) 497-6400

We will need the following in order to assist you:

- Your name, address and telephone number
- Product model and serial number
- Date of purchase
- Dealer name and address
- Nature of the problem

After reviewing all the facts involved, you will be advised of what action can be taken. Please bear in mind that your problem will likely be resolved at the dealership, using the dealer's facilities, equipment and personnel, so it is very important that your initial contact be with the dealer.

Your purchase of a Honda product is greatly appreciated by both your dealer and American Honda Motor Company. We want to assist you in every way possible to assure your satisfaction with your purchase.

For future reference, record your unit's serial number and date of purchase in the spaces below. Refer to this information when ordering parts and when making technical or warranty inquiries.

Model: FS5047 **Serial Number:** ________________ **Date of Purchase:** ______________

Current customer service contact information:

United States, Puerto Rico, and U.S. Virgin Islands:

Honda Power Equipment dealership personnel are trained professionals. They should be able to answer any question you may have. If you encounter a problem that your dealer does not solve to your satisfaction, please discuss it with the dealership's management. The Service Manager or General Manager can help. Almost all problems are solved in this way.

If you are dissatisfied with the decision made by the dealership's management, contact the Honda Power Equipment Customer Relations Office. You can write:

American Honda Motor Co., Inc.
Power Equipment Division
Customer Relations Office
4900 Marconi Drive
Alpharetta, GA 30005-8847

Or telephone: (770) 497-6400 M-F, 8:30 am - 5:00 pm EST

When you write or call, please provide the following information:

- Model and serial numbers
- Name of the dealer who sold the Honda power equipment to you
- Name and address of the dealer who services your equipment
- Date of purchase
- Your name, address, and telephone number
- A detailed description of the problem

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